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24737 7590 04/17/2008

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BRIARCLIFF MANOR, NY 10510

EXAMINER

FAULK, DEVONA E

ART UNIT

PAPER NUMBER

2615

DATE MAILED: 04/17/2008

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/510,219	10/05/2004	Ronaldus Maria Aarts	NL 020283	8663

TITLE OF INVENTION: CODING OF STEREO SIGNALS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1440	\$300	\$0	\$1740	07/17/2008

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. **PROSECUTION ON THE MERITS IS CLOSED.** THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN **THREE MONTHS** FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. **THIS STATUTORY PERIOD CANNOT BE EXTENDED.** SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
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INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

24737 7590 04/17/2008

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Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/510,219 10/05/2004

Ronaldus Maria Aarts

NL 020283

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TITLE OF INVENTION: CODING OF STEREO SIGNALS

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nonprovisional	NO	\$1440	\$300	\$0	\$1740	07/17/2008

EXAMINER	ART UNIT	CLASS-SUBCLASS
FAULK, DEVONAE	2615	381-016000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a **Customer Number is required.**

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 _____
 (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 _____
 3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
☐ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
☐ Payment by credit card. Form PTO-2038 is attached.
☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____ Date _____
 Typed or printed name _____ Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 495 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 495 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Notice of Allowability**Application No.**

10/510,219

Applicant(s)

AARTS ET AL.

Examiner

DEVONA E. FAULK

Art Unit

2615

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to amendment filed on 2/1/08.
2. ☒ The allowed claim(s) is/are 1,3,7-10,12-14,16-22.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some* c) ☐ None of the:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
(a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
(b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 2/1/2008 has been entered.

Response to Remarks

2. Claims 6,18,19 were indicated as allowable subject matter in the previous rejection. The applicant amended the claims to include the indicated allowable subject matter. The examiner, upon further consideration, determined that an examiner's amendment was needed to place the claims in allowable form. The applicant agreed to the examiner's amendment.

3. Claims 2,5-6,11,15 are cancelled.

EXAMINER'S AMENDMENT

4. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Dicran Halajian (Reg. No. 39,703) on 4/9/2008.

The claims are to be amended as follows:

Claim 4: Cancel.**Claim 1 is to be amended to recite:**

1. A method of encoding a multichannel signal including at least a first signal component and a second signal component, the method comprising the acts of:

transforming at least the first and second signal components by a rotation into a principal signal including most of the signal energy and at least one residual signal including less energy than the principal signal, the rotation being parameterised by at least one angle of rotation, wherein said angle of rotation corresponds to a direction of high signal variance;

representing the multichannel signal at least by the principal signal, the angle of rotation and the at least one residual signal;

encoding the principal signal with a first bit rate; and

encoding the at least one residual signal with a second bit rate smaller than the first bit rate; and

adaptively determining the angle of rotation based on at least the first and second signal components.

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3.(Previously Presented) The method according to claim 1, wherein the principal signal corresponds to a principal component of the first and second signal components.

Claim 8 is to be amended to recite:

8. The method according to claim 1, wherein

the method further comprises the act of estimating the at least one residual signal from the principal signal using a prediction filter corresponding to a set of filter parameters; and

the act of representing the multichannel signal at least by the principal signal and the angle of rotation comprises the act of representing the multichannel signal by the principal signal, the angle of rotation, and the set of filter parameters.

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Claim 10 is to be amended to recite:

10. A method of decoding multichannel signal information, the method comprising the acts of:

receiving a principal signal encoded with a first bit rate, at least one residual signal encoded with a second bit rate, and an angle of rotation, wherein the second bit rate is smaller than the first bit rate, the principal signal corresponding to a result of a rotation of at least a first and a second signal component of a multichannel source signal, the rotation being parameterised by at least the angle of rotation, wherein the angle of rotation corresponds to a direction of high signal variance and is adaptively determined based on at least the first and second signal components; and generating a first and a second decoded signal component by inversely transforming the received principal signal and the at least one residual signal.

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Claim 12 is to be amended to recite:

12.(Currently Amended) The method according to claim 10, wherein the act of receiving the principal signal and the angle of rotation further comprises the act of receiving a set of filter parameters, and the method further comprises the act of predicting the at least one residual signal from the principal signal using a prediction filter corresponding to the received set of filter parameters.

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Claim 13 is to be amended to recite:

13. An arrangement for encoding a multichannel signal including at least a first signal component and a second signal component, the arrangement comprising:

first processing means adapted to transform at least the first and second signal components by a rotation into a principal signal including most of the signal energy and at least one residual signal including less energy than the principal signal, the rotation being parameterised by at least one angle of rotation, to encode the principal signal with a first bit rate; and to encode the at least one residual signal with a second bit rate smaller than the first bit rate; wherein the angle of rotation corresponds to a direction of high signal variance and is adaptively determined based on at least the first and second signal components; and

second processing means adapted to represent the multichannel signal at least by the principal signal, the angle of rotation and the at least one residual signal.

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Claim 14 is to be amended to recite:

14. An arrangement for decoding multichannel signal information, the arrangement comprising

receiving means for receiving a principal signal encoded with a first bit rate, at least one residual signal encoded with a second bit rate, and an angle of rotation, wherein the second bit rate is smaller than the first bit rate, the principal signal

corresponding to a result of a rotation of a first and a second multichannel source signal, the rotation being parameterised by at least the angle of rotation, wherein the angle of rotation corresponds to a direction of high signal variance and is adaptively determined based on at least the first and second signal components; and

processing means for generating a first and a second multichannel signal by inversely transforming the received principal signal and a residual signal.

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Claim 16 is to be amended to recite:

16.(Currently Amended) A computer-readable medium comprising computer program code ~~for causing~~ executable by a computer to:

transform at least first and second signal components of a multichannel signal by a rotation into a principal signal including most of the signal energy and at least one residual signal including less energy than the principal signal, the rotation being parameterised by at least one angle of rotation, wherein the angle of rotation corresponds to a direction of high signal variance and is adaptively determined based on at least the first and second signal components;

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represent the multichannel signal at least by the principal signal, the angle of rotation and the at least one residual signal;

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encoding the principal signal with a first bit rate; and

encoding the at least one residual signal with a second bit rate smaller than the first bit rate.

Claim 17 is to be amended to recite:

17.(Currently Amended) A device for communicating a multichannel signal including at least a first signal component and a second signal component, the device comprising an arrangement for encoding the multichannel signal, the arrangement including

first processing means adapted to transform at least the first and second signal components by a rotation into a principal signal including most of the signal energy and at least one residual signal including less energy than the principal signal, the rotation being parameterised by at least one angle of rotation, wherein the angle of rotation corresponds to a direction of high signal variance and is adaptively determined based on at least the first and second signal components;

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second processing means adapted to represent the multichannel signal at least by the principal signal, the angle of rotation and the at least one residual signal;

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encoding the principal signal with a first bit rate; and

encoding the at least one residual signal with a second bit rate smaller than the first bit rate.

Claim 18 is to be amended to recite:

18. A method of encoding a multichannel signal including at least a first signal component and a second signal component, the method comprising the acts of:

transforming at least the first and second signal components by a rotation into a principal signal including most of the signal energy and at least one residual signal including less energy than the principal signal, the rotation being parameterized by at least one angle of rotation, wherein said angle of rotation corresponds to a direction of high signal variance;

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representing the multichannel signal at least by the principal signal, and the angle of rotation;

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adaptively determining the angle of rotation based on at least the first and second signal components; and

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controlling a prediction filter by an error signal indicative of a difference of the at least one residual signal and an estimate of the at least one residual signal.

Claim 20 is to be amended to recite:

20. An arrangement for encoding a multichannel signal including at least a first signal component and a second signal component, the arrangement comprising:

first processing means adapted to transform at least the first and second signal components by a rotation into a principal signal including most of the signal energy and at least one residual signal including less energy than the principal signal, the rotation being parameterized by at least one angle of rotation, wherein said angle of rotation corresponds to a direction of high signal variance, and to control a prediction filter by an error signal indicative of a difference of the at least one residual signal and an estimate of the at least one residual signal, wherein the angle of rotation is adaptively determined based on at least the first and second signal components; and

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second processing means adapted to represent the multichannel signal at least by the principal signal and the angle of rotation.

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Claim 21 is to be amended to recite:

21.(Currently Amended) A computer-readable medium comprising computer program code for causing executable by a computer to:

transform at least first and second signal components of a multichannel signal by a rotation into a principal signal including most of the signal energy and at least one residual signal including less energy than the principal signal, the rotation being parameterized by at least one angle of rotation, wherein the angle of rotation corresponds to a direction of high signal variance and is adaptively determined based on at least the first and second signal components;

represent the multichannel signal at least by the principal signal and the angle of rotation; and

control a prediction filter by an error signal indicative of a difference of the at least one residual signal and an estimate of the at least one residual signal.

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Claim 22 is to be amended to recite:

22.(Currently Amended) A device for communicating a multichannel signal including at least a first signal component and a second signal component, the device comprising an arrangement for encoding the multichannel signal, the arrangement including

first processing means adapted to transform at least the first and second signal components by a rotation into a principal signal including most of the signal energy and at least one residual signal including less energy than the principal signal, the rotation being parameterized by at least one angle of rotation, and to control a prediction filter by an error signal indicative of a difference of the at least one residual signal and an estimate of the at least one residual signal, wherein the angle of rotation corresponds to a direction of high signal variance and is adaptively determined based on at least the first and second signal components; and

second processing means adapted to represent the multichannel signal at least by the principal signal and the angle of rotation.

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5. Claims 1,3,7-10,12-14,16-22 are allowed.

6. The following is an examiner's statement of reasons for allowance: Regarding claims 1,10,13,14,16-22, prior art Loughlin (US 4,589,127) discloses a method of encoding (Figure 3 reads on an arrangement and device for encoding of claims 13 and 17) a multichannel signal including at least a first signal component and a second signal component, the method comprising the steps of transforming at least the first and second signal components by a predetermined transformation into a principal signal including most of the signal energy and at least one residual signal including less energy than the principal signal (Figure 3; column 4, line 66-column 7, line 65; 10 or 12 of Figure 3 first reads on the first processing means adapted to transform at least the first and second signal of claims 13 and 17),the predetermined transformation being parameterized by at least one transformation parameter; and representing the multichannel signal at least by the principal signal and the transformation parameter (Figure 3; column 4, line 66-column 7, line 65; 22 transmitter reads on second processing means adapted to represent the multichannel signal of claims 13 and 17). Prior art Davis et al. (US 5,291,557) discloses using adaptive processing while encoding a multichannel signal (column 6, lines 29-65). Prior art Gerzon (US 5,671,287) discloses a stereophonic signal processor. Prior art Handel et al. (US 6,430,295) discloses methods and apparatus for measuring signal level and delay at multiple sensors including controlling a prediction filter by an error signal indicative of a difference of a signal and an estimate of said signal. Prior art Herre (US 5,812,971)

discloses enhanced joint stereo coding method using temporal envelope shaping.

Generally encoding and decoding methods are known in the art.

Regarding claims 1,10,13,14,16,17,18,20-22 the prior art or combination thereof fails to disclose or make obvious encoding the principal signal with a first bit rate and encoding the at least one residual signal with a second bit rate smaller than the first bit rate; the rotation being parameterised by at least one angle of rotation, wherein said angle of rotation corresponds to a direction of high signal variance and adaptively determining the angle of rotation based on at least the first and second signal components.

Therefore the prior art fails to disclose or make obvious a method of encoding a multichannel signal, a method of decoding a multichannel signal, an arrangement for encoding a multichannel signal, an arrangement for decoding multichannel signal information,, a device for communication a multichannel signal as claimed.

Claims 3,7-9,12,19 are allowed due to dependency on claims 1,11 and 18.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DEVONA E. FAULK whose telephone number is (571)272-7515. The examiner can normally be reached on 8 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached on 571-272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DEF

/Vivian Chin/
Supervisory Patent Examiner, Art Unit 2615